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Design and Develop Low-Cost Device on Monitoring Environmental Indoor Air Quality in Factory

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Abstract: Environmental indoor air quality is one of the major concerns in occupational safety and health issues related to workers. Nowadays, the evolving of Internet of Things (IoT), the monitoring of the surrounding environmental desired parameters is more fascinating with the use of various sensors. Real time data now can be monitored with the Wi-Fi connection where the data being transfer across the network cloud with different platform service. This research focus is on the environmental monitoring for indoor air quality in terms of carbon monoxide (CO) in selected palm oil mill factory. This project aims to benefit the workers in a way where air quality is monitored. This low-cost device air quality monitoring (LCDAQM) used an ESPduino-32 to collect and process sensed data to the ThingSpeak platform service that can be monitored through web based or apps. The level of the carbon monoxide (CO) will light up the red LED when reach more than 50ppm which was set by OSHA. Result shows that level of CO in factory is unhealthy and need future engineering control action. The validation between LCDAQM and RS CO meter show the percentage error of 14.41%. Therefore, this study will help workers and factory to monitor and reduce the occupational safety and health (OSH) related problems to indoor air quality in factory.

Keywords: *Environmental, Low-Cost EMG, Monitoring, Indoor Air Quality, CO, Factory, OSH*

INTRODUCTION

In this industrial revolution era, factories are growing as it is a platform for mass production of products to be used in everyday life. A factory can be very huge in size that requires a lot of workers to function all the tools or machine to initiate mass production. The products vary from processed food, electric appliances, cleaning utensils, writing utensils, clothing, car spare parts, smart phones, cleaning chemicals, tools and many more products that requires mass production. Monitoring system can help ensure the safety of people and reduce compensation among workers.

Other than that, monitoring system can be monitoring the ultraviolet level, water level, and air quality monitoring. It will then sound alarm indicating that a dangerous level has been reached. This help to alert people to avoid certain places that are affected by dangerous condition. The alarm should not be limited by making an alarm sound. It can be emergency light, alert from a phone, or informed by a security which oversees alerting other workers. Conventionally, monitoring system for air quality are usually deals with large sizes and high costs for installation and maintenance [1]. Furthermore, it is time-consuming procedures are needed offline even though the precise data collection results can be produced [2]. Thus, air quality data is hard to gathered while offline and his may led to environmental problem issues if the data is not

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